

Abstract

Nanofluidic entropic traps, comprising alternating thin and thick regions, sieve small molecules such as DNA or protein polymers and other molecules. The thick region is comparable or substantially larger than the molecule to be separated, while the thin region is substantially smaller than the size of the molecules to be separated. Due to the molecular size dependence of the entropic trapping effect, separation of molecules may be achieved. In addition, entropic traps are used to collect, trap and control many molecules in the nanofluidic channel. A fabrication method is disclosed to provide an efficient way to make nanofluidic constrictions in any fluidic devices.